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Case Report

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Bedside ultrasonography in diagnosing bilateral femoral arterial occlusion in an elderly patient with acute limb ischemia

Baycan Kuş, Merve İrem Atıcı, Ömer Salt
Department of Emergency Medicine, Kayseri City Hospital, Kayseri, Turkiye

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Corresponding Author: Baycan Kuş, drcan86@gmail.com

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ABSTRACT

Aims: Non-traumatic acute limb ischemia is a critical vascular emergency that can lead to limb loss or life-threatening complications1. It is predominantly caused by arterial occlusions due to thrombi or emboli. Our report highlights the pivotal role of bedside ultrasonography in the emergency diagnosis of acute limb ischemia, exemplified by a case of bilateral femoral arterial occlusion.

Case: An 83-year-old woman with a medical history of atrial fibrillation, not on anticoagulation therapy, presented to the emergency department with increased right knee pain and dizziness. Initial examination revealed palpable peripheral pulses and sensitivity on knee palpation without overt signs of ischemia. However, subsequent systemic examination, prompted by the patient's worsening agitation and pain, revealed coldness, pallor, and weakened pulses in both lower extremities. Bedside ultrasonography confirmed the presence of thrombi in both femoral arteries. The patient underwent successful emergency thrombectomy and was discharged with full recovery after appropriate management of atrial fibrillation.

Conclusion: This case underscores the importance of vigilant systemic re-examination and the utility of bedside ultrasonography in the rapid diagnosis of acute arterial occlusion, particularly in patients with risk factors such as atrial fibrillation. Emergency physicians should consider acute limb ischemia in the differential diagnosis of patients presenting with non-specific symptoms like dizziness and localized pain, especially when coupled with a history of cardiovascular risk factors.

Keywords: Emergency medicine, bedside ultrasonography, acute arterial occlusion

INTRODUCTION

Non-traumatic acute limb ischemia is a significant vascular emergency with potential consequences that can range from limb loss to life-threatening systemic complications.[1] It primarily results from impaired arterial blood flow due to a thrombus, which accounts for approximately 85% of cases, or an embolism, responsible for about 15% of instances. While acute limb ischemia is commonly associated with the middle-aged and elderly populations, it can also occur in younger patients under specific circumstances affecting arterial circulation, such as paradoxical embolism, intracardiac masses, endocarditis, or hypercoagulability syndromes.[2-4]

The most frequent source of an embolism causing acute limb ischemia is cardiac in origin. Conditions like apical thrombus formation and age-related atrial fibrillation, along with left ventricular dysfunction, are the predominant causes of cardioembolic events. This condition affects both male and female populations equally.[2]

The femoral artery is notably vulnerable to occlusions. Approximately two-thirds of non-cerebral emboli lead to blockages in the lower extremities, with a significant proportion involving the aorto-ilio-femoral arteries. Diagnosis of acute limb ischemia can be challenging due to its ability to induce sensory and motor deficits, which mimic the symptoms of a cerebrovascular accident.[5]

Our case illustrates the critical role of emergency physicians in the early recognition and diagnosis of acute arterial occlusion. We emphasize the utility of bedside ultrasonography as an integral part of the physical examination, aiding in the rapid diagnosis of this condition. The case of an 83-year-old woman with atrial fibrillation, who was not on anticoagulant therapy and presented with neurological symptoms, highlights the complexity of diagnosis in the emergency setting. Our case serves as a reminder of the importance of considering acute arterial occlusion in differential diagnosis, particularly in patients with known risk factors.

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CASE

Here, we present an 83-year-old female patient, known to have hypertension, heart failure, and hypothyroidism, and under medication with furosemide, ramipril, carvedilol, and levothyroxine whose medical history was obtained from accompanying relatives, due to her hearing and speech impairments.

She was admitted to the emergency department with complaints of increased pain in her right knee and dizziness, experienced after a nocturnal visit to the bathroom. Her medical history revealed a knee surgery performed two years prior, with subsequent chronic pain in the same area.

Upon initial examination, her vital signs were as follows: arterial pressure 117/87 mmHg, pulse rate 96/min, body temperature 36.6°C, and oxygen saturation 96% on room air. The right knee was tender on palpation, but there was no noticeable increase in temperature, hyperemia, or edema. Peripheral pulses were palpable, and a detailed neurological examination did not reveal any acute pathological findings. Knee radiography was performed, showing no acute abnormalities.

However, during subsequent observation, the patient exhibited signs of agitation and engaged in non-purposeful movements. Laboratory tests were ordered, and brain imaging was conducted to rule out a cerebrovascular accident, both of which reported without any acute pathological findings. The patient's ECG indicated atrial fibrillation. Given her chronic AF and lack of anticoagulant therapy, there was a heightened risk for embolic events. Cardiac biomarkers were within normal limits, excluding acute coronary syndrome.

As the patient's agitation persisted, a second systemic examination was performed. This time, we observed signs of acute arterial occlusion- notably, coldness, pallor, weakened pulses in both lower extremities, which were absent in the initial examination. Bedside ultrasonography revealed thrombi in both femoral arteries, leading to the diagnosis of bilateral femoral arterial occlusion (Figure).

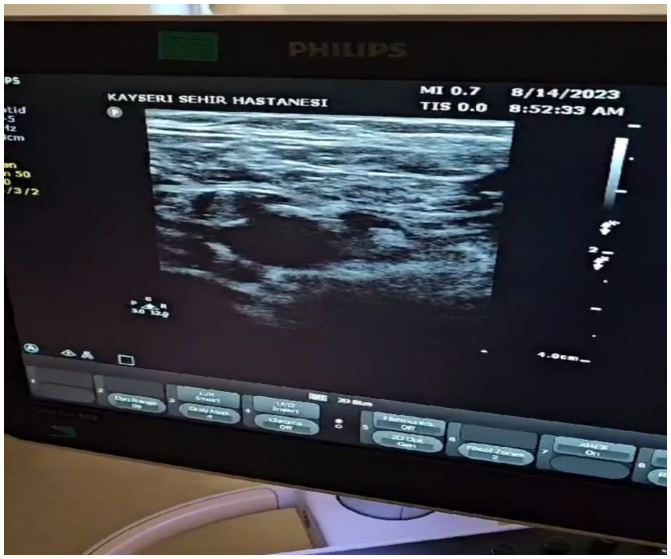

Figure. Thrombi in the patient's right and left femoral arteries (white arrows)

Emergency consultation with a cardiovascular surgeon resulted in an immediate thrombectomy. Post-surgery, the patient commenced appropriate treatment for atrial fibrillation and was discharged in approximately two weeks, fully recovered.

DISCUSSION

The complexity of diagnosing acute limb ischemia (ALI) in elderly patients, particularly when they present with non-specific symptoms, is exemplified in the case of our 83-year-old patient. Acute limb ischemia, characterized by a sudden decrease in limb perfusion, can lead to severe outcomes, including limb loss if not promptly recognized and appropriately managed1. The diagnostic challenge is further compounded in elderly patients who often have multiple comorbidities and may present with atypical symptoms. In the context of ALI, the well-established clinical indicators, known as the 6P's (paresthesia, pain, pallor, pulselessness, poikilothermia, paralysis), should be rigorously sought in physical examinations.[2] However, these symptoms may not be immediately apparent, as demonstrated by our patient's initial presentation with knee pain and dizziness, masking the underlying vascular emergency. Atrial fibrillation (AF), a common arrhythmia in the elderly, significantly increases the risk of stroke and peripheral arterial thromboembolism.[3] The absence of anticoagulation therapy in patients with AF, as in our case, further elevates the risk for embolic events. Consequently, patients presenting with neurological symptoms and a history of AF, particularly those not on anticoagulation therapy, should be thoroughly evaluated for potential thromboembolic events, including ALI.[5] The use of bedside ultrasonography in the emergency department played a crucial role in diagnosing bilateral femoral arterial occlusion in our patient. This non-invasive, rapid, and reliable imaging modality is increasingly recognized as a valuable tool in emergency medicine for evaluating vascular emergencies.[7,8] In contrast, computed tomography (CT) angiography and magnetic resonance (MR) angiography, while effective, may not be suitable for all patients due to potential nephropathy from contrast agents and the time-consuming nature of these procedures.[6]

CONCLUSION

It is imperative for emergency physicians to conduct comprehensive and iterative assessments in elderly patients, especially those presenting with non-specific symptoms. A heightened awareness of acute limb ischemia as a potential diagnosis is crucial, particularly in patients with known risk factors like atrial fibrillation. The application of bedside ultrasonography emerges as an invaluable diagnostic tool, facilitating prompt diagnosis and intervention. Such proactive and thorough approaches are key to enhancing patient outcomes in acute vascular emergencies.

ETHICAL DECLARATIONS

Informed Consent

The patient signed and free and informed consent form.

Referee Evaluation Process
Externally peer-reviewed.

Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Financial Disclosure
The authors declared that this study has received no financial support.

Author Contributions
All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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